

## 8-1: Formulas for Sequences

**Warm-up:** Write the first six terms of each sequence.

1.  $\begin{cases} a_1 = 2 \\ a_n = a_{n-1} + 2n - 1, \text{ for int } n \geq 2 \end{cases}$       2.  $a_n = n^2 + 1, \text{ for int } n \geq 1$

3. What do you notice about your answers for 1 and 2?

*Sequence:*

*Term and position:*

*Explicit formula:*

*Recursive formula:*

*Example 1:* a. What is the 9<sup>th</sup> term of the sequence 2, 4, 6, 8, ...?

- b. Did you use an explicit or recursive formula?

*Arithmetic Sequence:*

*Formulas for arithmetic sequences:*

*Example 2:* Give a recursive formula for the increasing sequence of positive odd numbers.

*Example 3:* Which term is 344 in the arithmetic sequence 8, 15, 22, 29, ...?

*Geometric sequence:*

*Formulas for geometric sequences:*

*Example 4:* Suppose a model train collection valued now at \$2000 increases 5% in value each year.

- a. Give its value for next year.
- b. Give the value of the collection  $n$  years from now.
- c. What will its value be 10 years from now?

Homework:

*"I am always doing that which I can not do, in order that I may learn how to do it." – Pablo Picasso*